

OPERATING INSTRUCTIONS  
for the  
FAIRCHILD MAGNETIC TAPE RECORDER - UNIT 100

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### GENERAL

The Fairchild Magnetic Tape Recorder, Unit 100, is designed to meet the operational and technical requirements of professional installations. The electrical and mechanical specifications and features of this Tape Recorder were determined by you, the Engineers, Operators, and Management of Broadcast Stations, Recording Studios and Government Agencies.

As with all high quality equipment, the fullest advantages and capabilities can best be realized with a thorough knowledge of the proper operating techniques.

The Fairchild tape Recorder incorporates electro-mechanical inter-locking to eliminate human error. Tape breakage and accidental erasure of recorded material has been virtually eliminated, and yet complete flexibility of control and operation has been maintained.

Clearly labelled push-buttons are so arranged as to follow in a normal, instinctive order. Rugged construction of mechanical assemblies and oversized electrical components fulfill the requirements for long trouble free, continuous duty.

### TAPE RECORDER DESCRIPTION

Only 3 external connections are necessary:

1. A.C. Line Power (117 volts, 60 cycles).
2. Audio Input (minimum level for full modulation, -20 dbm).
3. Audio Output (zero level).

These connections terminate at standard receptacles at the rear of the cabinet. Facing the rear of the cabinet, the A.C. Line terminates at a standard Hubbell male receptacle at the lower right corner. Above this, upper right, a standard Cannon, type P-3, female receptacle is for AUDIO INPUT. Opposite this, upper left corner, a standard Cannon, type P-3, male receptacle is provided for AUDIO OUTPUT.

Looking at the front control-VU panel we see the following. To the left of the VU meter is an INPUT GAIN control, calibrated in 2 db steps from 0 to 40 db. This adjusts the level between the audio line and the input to the record amplifier. To the right of the VU meter is the OUTPUT GAIN control, calibrated in 2 db steps from 0 to 40 db. At the extreme left of this panel is a line of 4 push-buttons.

This provides a convenient means of switching the meter to four different circuits. Depressing the button marked RECORD, in this line, places the VU meter across the record head. The meter, in this position, reads the audio level with recording equalization. The BIAS and ERASE push-buttons read their respective currents. If it is desirable to read these currents during "stand-by", depress and hold the RECORD push-button at the extreme right of the panel while operating the BIAS or ERASE push-buttons. The fourth button in this line places the VU meter across the output of the play-back amplifier. With the meter in this position, the audio signal is read with play-back equalization inserted. These 4 push-buttons provide an instant indication of the proper functioning of the equipment.

The "condition of operation" is determined by the push-buttons and signal lights at the right side of the front-control-VU panel. The push-buttons are electro-mechanically interlocked and are clearly labelled to indicate their functions. They are so placed that their operation follows a natural sequence.

The WHITE light indicates STAND-BY or WIND condition. The BLUE light indicates PLAYBACK, and the RED light indicates RECORD condition. The line of 4 push-buttons directly below the lights are used to set the "condition of operation" for winding the tape, recording and playing back.

The Tape is put into motion by depressing either the FORWARD or REVERSE push-buttons in the bottom line.

The magnetic tape is shipped in a convenient "AUTOPACT" container. Using this container makes it unnecessary to handle the tape while placing it on, and removing it from the recorder.

#### TO USE THE "AUTOPACT" TAPE CONTAINER:

Remove the hub caps from the SUPPLY DISK and the TAKE-UP DISK (see fig. 1). This is done by lightly holding the disk and turning the hub cap counter-clockwise. The circular plate on which are mounted the three vertical guide pins rises about 1/8" on its spring mounting. This gives mechanical assistance in removing the tape from its container. Hold the "FAIRCHILD AUTOPACT MAGNETIC TAPE CONTAINER" so that the label is face-up. Tilt the box so that the inner container slides out easily. A flap on the inner container prevents the tape from falling. The roll of magnetic tape is wound on a hub with a standard

inside diameter to fit the tape disk of the Fairchild Recorder. Do not yet remove the roll of tape from its cover. With the cut-away side of the container that exposes the tape hub facing down, place the roll of tape on the supply disk (see fig. 1). Rotate the tape hub slightly until the three holes drop in place over the vertical guide pins. Lift the flap at the center of the tape container, and slide the container horizontally away. An empty tape winding hub, with a standard inside diameter to fit the take-up disk, is supplied with the Fairchild Recorder. Place this on the center of the tape TAKE-UP DISK (see fig. 1). Replace the hub caps.

To remove the tape from the disk, take off the hub cap by turning counter-clockwise. The roll of tape is automatically raised 1/8" above the tape disk. Reverse the procedure just described for placing the tape onto the disk, and the tape is neatly enclosed in its container for storage or shipping.

#### OPERATING THE FAIRCHILD PROFESSIONAL TAPE RECORDER

The sequence of push-button operation to perform typical functions is given.

Depress push-buttons labelled STOP and OFF (on the right side of the control-VU panel). Throw the MASTER switch to the ON position. This applies A.C. to the power supply chassis and illuminates the VU meter. (Should the FORWARD, REVERSE, WIND, PLAY, or RECORD buttons be in a depressed position at the time the MASTER switch is turned ON, a protective interlock circuit renders them inoperative until they have been manually cycled through buttons STOP and OFF).

The play-back head and amplifier circuit is operative at all times, when the MASTER switch is ON.

TO WIND: With a small strip of "scotch tape", attach the free end of the roll of magnetic tape to the tape hub on the TAKE-UP disk. Place the tape as shown by the dash-dot line in fig. 1. Rotate the take-up disk manually, counter-clockwise, to take up the slack. Depress the push-button labelled WIND. Immediately the relay and motor braking control circuits are preset, or alerted, and the tape is set for the fast speed of 150 inches per second. The WHITE light illuminates to indicate this "condition of operation". The bottom line of push-buttons starts the tape motion. To move the tape from left to right (from the SUPPLY DISK to the TAKE-UP DISK), depress the push-button labelled FORWARD. To move the tape from the TAKE-UP DISK to the SUPPLY DISK, depress the push-button labelled REVERSE.

It is recommended, though not necessary, that the STOP button be depressed when going from FORWARD to REVERSE, or from REVERSE to FORWARD.

If the tape is completely wound onto one hub, by accident or purpose, the photo-electric braking control electronically performs the functions of the STOP push-button.

To place the machine in operation after the automatic device has functioned, depress the STOP push-button and replace the tape across the idlers, interrupting the beam of light to the photo-cell.

**TO PLAY:** Place the tape in the position shown by the heavy solid line in figure 1. Depress the push-button WIND to preset the relay and motor control circuits (WHITE light goes on). Depress the push-button PLAY (BLUE light goes on). Automatically the pinch roller is brought into contact with the capstan and power is applied to the high-slip-torque motors of the supply and take-up disks, placing the proper tension on the tape. To start the tape motion, depress the button labelled FORWARD.

The audio output level is set by depressing the meter push-button OUTPUT and adjusting the OUTPUT GAIN CONTROL to read zero VU on audio peaks.

To stop the tape motion, depress push-button STOP. The motors are instantly braked.

To remove the tape, or to go to "stand-by", depress the WIND push-button. (The BLUE light goes out, the WHITE light goes on). This releases the pinch roller and removes tape tension.

**STANDBY:** For "stand-by" periods of short duration (waiting for a fast "go ahead"), depress the WIND and PLAY push-buttons. This is "stand-by". On cue, depress the FORWARD push-button.

**CUING:** Close cuing of program material can be done manually. The play-back amplifier is in operation at all times. Open the OUTPUT gain control, and, with the push-buttons STOP and OFF depressed, rotate the SUPPLY and TAKE-UP DISKS back and forth by hand, using the hub caps for this purpose. This is effectively the same procedure used in back-cuing transcriptions with a pickup.

To locate a cue that is at some distant point on the tape it is possible to monitor the tape at the fast speed of

150 inches per second. Place the tape across the heads as shown by the dotted line in fig. 1. Depress the WIND push-button, and set the tape in either FORWARD or REVERSE motion by depressing the respective push-button. When the desired cue is found, brakes are instantly applied to the tape motion by depressing the button labelled STOP.

Due to the abrasive action of the magnetic tape, it is not considered good practice to operate the equipment at the fast speed for any length of time with the tape running across the heads.

TO RECORD: Place the tape as shown by the solid line in fig. 1. Depress the WIND push-button (WHITE light), the PLAY push-button (BLUE light), and, holding the RECORD push-button in, depress the FORWARD button in the bottom line. (The RECORD push-button has a "spring return"). The RED light goes on indicating that the equipment is in the RECORD "condition of operation".

Bias and erase currents can be reference checked by depressing the meter push-buttons, on the left side of the control panel, labelled BIAS, and ERASE.

Optimum recording level is obtained by setting the OUTPUT GAIN CONTROL to straight up (20 db attenuation), depressing the OUTPUT push-button (left side of the panel) and adjusting the INPUT GAIN CONTROL to peak zero db on the VU meter.

To stop the recorder, depress push-button STOP. This applies the braking voltage to the motors and stops the tape motion. The RED light goes off and the BLUE light goes on, and the equipment is automatically in the PLAY "condition of operation".

Note that the bias and erase currents decay slowly when the equipment is taken out of the RECORD condition. This is designed to avoid "permming" the record head, and results in maintaining a high signal to noise ratio over long periods of time.

To restore the record "condition of operation" (the equipment is in the play "condition of operation"), depress and hold in the RECORD push-button and simultaneously depress the FORWARD push-button. The RED light goes on, bias-erase current is restored, and program is being recorded.

Previously recorded audio is automatically erased by a



60 kc. signal fed to the erase head. This provides a 70 decibel erasure of the signal.

**MONITORING:** The physical placement of the record and play-back heads is such that the tape passes across the play-back head a fraction of a second after the signal is recorded. A bridging amplifier placed across the output of the equipment will permit monitoring of the signal simultaneously with recording.

**HOLD DOWN PLATE:** Starting with serial number 4910, Unit 100 Fairchild Professional Tape Recorders incorporate high speed forward and reverse tape wind of approximately 20/1. Dimensional irregularities of tape may cause a turn of tape to be thrown during high speed operation. To obviate this possibility a special tape hold-down plate is supplied.

Wind a few turns of tape onto the take-up hub by the normal use of push button control. Stop the machine, and place the hold down plate over the tape knob of the take-up hub. The hold-down plate rests on the top surface of the tape. Resume normal push button operation for fast forward or reverse.

**VENTILATION:** If the Tape Recorder is to be operated under conditions exceeding normal room temperatures of 75 to 80 degrees, the doors should be left open.